

What is Claimed is:

1. A method of fabricating a light emitting device including a silicon carbide substrate having first and second opposing faces and a light emitting element on a first face of the substrate, comprising:
5 directly etching the second face of the silicon carbide substrate utilizing an aqueous etch to remove a damaged portion of the substrate resulting from processing of the substrate.
2. The method of Claim 1, wherein the damaged portion of the second face of the silicon carbide substrate results from sawing the substrate, lapping the
10 substrate, polishing the substrate, implantation in the substrate and/or laser processing the substrate.
3. The method of Claim 1, wherein directly etching the second face of the silicon carbide substrate is carried out subsequent to singulation of the light emitting
15 device from a wafer.
4. The method of Claim 1, wherein directly etching the second face of the silicon carbide substrate is carried out prior to singulation of the light emitting device from a wafer.
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5. The method of Claim 5, wherein the aqueous etch comprises an etch with KOH:K₃Fe(CN)₆.
6. The method of Claim 1, wherein directly etching the second face of the silicon carbide substrate further comprises etching a carbon-faced surface of the
25 silicon carbide substrate.
7. The method of Claim 6, wherein the carbon-faced surface of the silicon carbide substrate comprises a carbon-faced surface of a sidewall of the substrate.
8. The method of Claim 1, wherein directly etching the second face of the silicon carbide substrate further comprises etching a non-carbon-faced surface of the
30 silicon carbide substrate.

9. The method of Claim 1, wherein directly etching the second face of the
5 silicon carbide substrate comprises directly etching a surface oblique to the second
face of the silicon carbide substrate.

10. A method of increasing light output of a light emitting device,
comprising:
10 etching a substrate of the light emitting device using an aqueous etch to at
least partially remove a light absorption region of the substrate of the light emitting
device.

11. The method of Claim 10, wherein the light absorption region
15 corresponds to a region of the substrate damaged by processing the substrate in
fabrication of the light emitting device.

12. The method of Claim 11, wherein the region of the substrate damaged
by processing the substrate corresponds to a saw groove in the substrate.
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13. The method of Claim 11, wherein the region of the substrate damaged
by processing the substrate corresponds to a lapped, polished, implanted and/or laser
processed region of the substrate.

14. The method of Claim 10, wherein the substrate comprises a silicon
25 carbide substrate.

15. The method of Claim 14, wherein etching a substrate comprises
etching a carbon face of the silicon carbide substrate.
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16. The method of Claim 15, wherein etching a substrate further comprises
etching a non-carbon face of the silicon carbide substrate.

17. The method of Claim 14, wherein etching a substrate comprises etching a carbon face sidewall of the silicon carbide substrate.

5 18. The method of Claim 10, wherein the substrate comprises a sapphire substrate.

19. The method of Claim 10, wherein etching a substrate is carried out subsequent to singulation of the light emitting device.

10 20. The method of Claim 10, wherein the aqueous etch comprises etching with KOH:K₃Fe(CN)₆.

21. The method of Claim 20, wherein the aqueous etch is carried out for at least about 50 minutes.

15 22. The method of Claim 20, wherein the aqueous etch is carried out at a temperature of at least about 80 °C.

20 23. The method of Claim 10, wherein etching a substrate comprises directly etching the substrate.

24. A method of fabricating a light emitting device, comprising:
etching a substrate of the light emitting device using an aqueous etch and
using etching parameters that are sufficient to increase an amount of light extracted
25 through the substrate.

25. The method of Claim 24, wherein etching a substrate comprises etching a substrate to remove at least a portion of a region of the substrate damaged by processing the substrate in fabrication of the light emitting device.

30 26. The method of Claim 25, wherein the region of the substrate damaged by processing the substrate corresponds to a saw groove in the substrate.

27. The method of Claim 25, wherein the region of the substrate damaged by processing the substrate corresponds to a lapped, polished, implanted and/or laser processed region of the substrate.

5 28. The method of Claim 24, wherein the substrate comprises a silicon carbide substrate.

29. The method of Claim 28, wherein etching a substrate comprises etching a carbon face of the silicon carbide substrate.

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30. The method of Claim 29, wherein etching a substrate further comprises etching a non-carbon face of the silicon carbide substrate.

31. The method of Claim 29, wherein etching a substrate further comprises
15 etching a carbon face sidewall of the silicon carbide substrate.

32. The method of Claim 24, wherein the substrate comprises a sapphire substrate.

20 33. The method of Claim 24, wherein etching a substrate is carried out subsequent to singulation of the light emitting device.

34. The method of Claim 33, wherein the aqueous etch comprises etching with $\text{KOH}:\text{K}_3\text{Fe}(\text{CN})_6$.

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35. The method of Claim 34, wherein the aqueous etch is carried out for at least about 50 minutes.

36. The method of Claim 35, wherein the aqueous etch is carried out at a
30 temperature of at least about 80 °C.

37. The method of Claim 34, wherein etching a substrate comprises directly etching the substrate.

38. A method of fabricating a light emitting device, comprising:
etching a silicon carbide substrate of the light emitting device using an aqueous etch to remove at least a portion of amorphous silicon carbide from a surface of the silicon carbide substrate of the light emitting device.

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39. The method of Claim 38, wherein the amorphous silicon carbide corresponds to a region of the substrate damaged by processing the substrate in fabrication of the light emitting device.

10 40. The method of Claim 39, wherein the region of the substrate damaged by processing the substrate corresponds to a saw groove in the substrate.

41. The method of Claim 39, wherein the region of the substrate damaged by processing the substrate corresponds to a lapped, polished, implanted and/or laser
15 processed region of the substrate.

42. The method of Claim 38, wherein etching the substrate is carried out subsequent to singulation of the light emitting device.

20 43. The method of Claim 38, wherein the aqueous etch comprises etching with KOH: $K_3Fe(CN)_6$.

44. The method of Claim 43, wherein the aqueous etch is carried out for at least about 50 minutes.

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45. The method of Claim 43, wherein the aqueous etch is carried out at a temperature of at least about 80 °C.

46. The method of Claim 38, wherein etching a substrate comprises
30 directly etching the substrate.

47. A method of fabricating a light emitting device, comprising:
sawing a silicon carbide substrate of the light emitting device; and

etching at least one sawn surface of the silicon carbide substrate of the light emitting device.

48. The method of Claim 47, wherein etching at least one sawn surface comprises etching a carbon face of the silicon carbide substrate.

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49. The method of Claim 47, wherein etching at least one sawn surface further comprises etching a non-carbon face of the silicon carbide substrate.

50. The method of Claim 47, wherein etching at least one sawn surface further comprises etching a carbon faced sidewall of the silicon carbide substrate.

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51. The method of Claim 47, wherein etching at least one sawn surface is carried out subsequent to singulation of the light emitting device.

52. The method of Claim 47, wherein etching at least one sawn surface comprises performing an aqueous etch of the substrate.

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53. The method of Claim 52, wherein the aqueous etch comprises etching with KOH:K₃Fe(CN)₆.

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54. The method of Claim 53, wherein the aqueous etch is carried out for at least about 50 minutes.

55. The method of Claim 53, wherein the aqueous etch is carried out at a temperature of at least about 80 °C.

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56. The method of Claim 47, wherein etching at least one sawn surface comprises directly etching at least one sawn surface.